

In the Claims

Please amend the claims as follows:

1. (Currently Amended) A method of providing automated assistance in configuring customer premises equipment for communication with another network element, comprising:

automatically identifying at least one of a valid virtual channel and and/or a valid protocol valid for configuration with the customer premises equipment without prompting a user for information that directly or indirectly identifies the at least one of the valid virtual channel and the valid protocol; and

assisting the user ~~a user~~ in configuring the customer premises equipment for use with the identified at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~

2. (Cancelled)

3. (Currently Amended) The method of Claim 1, wherein automatically identifying at least one of a valid virtual channel and a valid protocol ~~a virtual channel and/or protocol~~ ~~valid for configuration~~ comprises initiating identification of the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~ without prompting the user for input.

4. (Currently Amended) The method of Claim 1, wherein automatically identifying at least one of a valid virtual channel and a valid protocol ~~a virtual channel and/or protocol~~ ~~valid for configuration~~ comprises identifying the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~ without accessing a memory storing the identification of the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~.

5. (Currently Amended) The method of Claim 1, wherein automatically ~~determining~~ identifying at least one of a valid virtual channel and a valid protocol ~~a virtual channel and/or a protocol valid~~ for configuration with the customer premises equipment comprises:

communicating over a virtual channel and toward a destination network element a probing configuration signal;

receiving over the virtual channel a response to the configuration signal; and

identifying as valid for configuration the at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~ associated with the response.

6. (Original) The method of Claim 5, wherein the probing configuration signal comprises an F5 Operations, Administration, and Maintenance loopback signal.

7. (Original) The method of Claim 5, wherein the probing configuration signal comprises a signal having a self configuring protocol.

8. (Original) The method of Claim 7, wherein the probing configuration signal comprises a Dynamic Host Configuration Protocol request, a Link Control Protocol Configuration Packet, or a Point-to-Point Over Ethernet (PPOE) PADI packet.

9. (Original) The method of Claim 8, wherein the protocol comprises an Internet over ATM protocol.

10. (Original) The method of Claim 8, wherein the protocol comprises a Point-to-Point over Asynchronous Transfer Mode protocol or a Point-to-Point over Ethernet protocol.

11. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises communicating the probing configuration signal over a plurality of virtual channels.

12. (Original) The method of Claim 11, wherein communicating the probing configuration signal over a plurality of virtual channels comprises communicating the signal over a first plurality of virtual channels that are likely to return a response.

13. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises:

- communicating the signal over a first virtual channel; and
- communicating the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channels expires.

14. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises:

- communicating a first probing communication signal over a virtual channel; and
- communicating a second probing configuration signal over the same virtual channel before a time out value associated with the first probing configuration signal expires.

15. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises communicating over a virtual channel a plurality of probing configuration signals, each signal associated with a different protocol.

16. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises communicating a plurality of probing configuration signals approximately simultaneously.

17. (Original) The method of Claim 16, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

- spawning a plurality of threads, each thread operable to process signals associated with at least one virtual channel;
- communicating a probing configuration signal over a plurality of virtual channels; and
- monitoring the probing configuration signal associated with each virtual channel using a separate thread.

18. (Original) The method of Claim 16, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over at least one virtual channel.

19. (Currently Amended) The method of Claim 1, wherein assisting a user in configuring the customer premises equipment for use with the identified at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~ comprises:

displaying the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~ to a user;

receiving the user's selection of the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~; and

configuring the customer premises equipment for operation using the selected at least one of the valid virtual channel and the valid protocol. ~~selected virtual channel and/or protocol.~~

20. (Currently Amended) The method of Claim 1, wherein assisting a user in configuring the customer premises equipment for use with the identified at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~ comprises automatically configuring the customer premises equipment for operation using the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~.

21. (Original) The method of Claim 1, further comprising:
communicating a diagnostic signal toward a destination network element; and
determining connectivity of a network layer based on whether a response to the diagnostic signal is received.

22. (Original) The method of Claim 21, wherein the diagnostic signal comprises a Protocol Internet Groper ("PING") signal operable to test an Internet Protocol layer of the network.

23. (Original) The method of Claim 21, wherein the diagnostic signal comprises a domain name server resolution request signal operable to test a Transmission Protocol layer of the network.

24. (Original) The method of Claim 21, wherein the diagnostic signal comprises a Hypertext Transmission Protocol request signal operable to test an Application layer of the network.

25. (Original) The method of Claim 21, further comprising reporting on the connectivity of a network layer based on whether a response to the diagnostic signal is received.

26. (Original) The method of Claim 1, wherein the customer premises equipment comprises a modem.

27. (Currently Amended) A computer readable medium operable to execute the following steps on a processor of a computer:

automatically identifying at least one of a valid virtual channel and a valid protocol a virtual channel and/or a protocol valid for configuration with the customer premises equipment without prompting a user for information that directly or indirectly identifies the at least one of the valid virtual channel and the valid protocol; and

assisting a user in configuring the customer premises equipment for use with the identified at least one of the valid virtual channel and the valid protocol and/or protocol.

28. (Cancelled)

29. (Currently Amended) The computer readable medium of Claim 27, wherein automatically identifying at least one of a valid virtual channel and a valid protocol a virtual channel and/or protocol valid for configuration comprises initiating identification of the at least one of the valid virtual channel and the valid protocol the valid virtual channel and/or protocol without prompting the user for input.

30. (Currently Amended) The computer readable medium method of Claim 27, wherein automatically identifying at least one of a valid virtual channel and a valid protocol a ~~virtual channel and/or protocol~~ valid for configuration comprises identifying the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~ without accessing a memory storing the identification of the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~.

31. (Currently Amended) The computer readable medium of Claim 27, wherein automatically ~~determining~~ identifying at least one of a virtual channel and a valid protocol ~~and/or a protocol~~ valid for configuration with the customer premises equipment comprises:
communicating over a virtual channel and toward a destination network element a probing configuration signal;
receiving over the virtual channel a response to the configuration signal; and
identifying as valid for configuration the at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~ associated with the response.

32. (Original) The computer readable medium of Claim 31, wherein the probing configuration signal comprises an F5 Operations, Administration, and Maintenance loopback signal.

33. (Original) The computer readable medium of Claim 31, wherein the probing configuration signal comprises a signal having a self configuring protocol.

34. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises communicating the probing configuration signal over a plurality of virtual channels.

35. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal over a plurality of virtual channels comprises communicating the signal over plurality of virtual channels likely to return a response.

36. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises:

- communicating the signal over a first virtual channel; and
- communicating the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channels expires.

37. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises:

- communicating a first probing communication signal over a virtual channel; and
- communicating a second probing configuration signal over the same virtual channel before a time out value associated with the first probing configuration signal expires.

38. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises communicating over a virtual channel a plurality of probing configuration signals, each signal associated with a different protocol.

39. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises communicating a plurality of probing configuration signals approximately simultaneously.

40. (Original) The computer readable medium of Claim 39, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

- spawning a plurality of threads, each thread operable to process signals associated with at least one virtual channel;
- communicating a probing configuration signal over a plurality of virtual channels; and
- monitoring the probing configuration signal associated with each virtual channel using a separate thread.

41. (Original) The computer readable medium of Claim 39, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over at least one virtual channel.

42. (Currently Amended) The computer readable medium of Claim 27, wherein assisting a user in configuring the customer premises equipment for use with the identified at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~ comprises:

displaying the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~ to a user;

receiving the user's selection of the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~; and

configuring the customer premises equipment for operation using the selected at least one of the valid virtual channel and the valid protocol ~~selected virtual channel and/or protocol~~.

43. (Currently Amended) The computer readable medium of Claim 27, wherein assisting a user in configuring the customer premises equipment for use with the identified at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~ comprises automatically configuring the customer premises equipment for operation using the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~.

44. (Original) The computer readable medium of Claim 27, further comprising:
communicating a diagnostic signal toward a destination network element; and
determining connectivity of a network layer based on whether a response to the diagnostic signal is received.

45. (Original) The computer readable medium of Claim 44, wherein the diagnostic signal comprises a signal selected from a group consisting of a Protocol Internet Groper ("PING") signal, a domain name server resolution request signal, and a Hypertext Transmission Protocol request signal.

46. (Original) The computer readable medium of Claim 44, further comprising reporting on the connectivity of a network layer based on whether a response to the diagnostic signal is received.

47. (Original) The computer readable medium of Claim 27, wherein the customer premises equipment comprises a modem.

48. (Currently Amended) An apparatus operable to provide automated assistance in configuring customer premises equipment, the apparatus comprising:

a configuration manager operable to automatically identify at least one of a valid virtual channel and a valid protocol ~~a virtual channel and/or a protocol~~ valid for configuration with the customer premises equipment without prompting a user for information that directly or indirectly identifies the at least one of the valid virtual channel and the valid protocol; and

a memory accessible to the configuration manager and operable to store an identifier of the at least one of the valid virtual channel and the valid protocol ~~a valid virtual channel~~ based on a response to a probing configuration signal ~~the response to the probing configuration signal~~.

49. (Cancelled)

50. (Currently Amended) The apparatus of Claim 48, wherein the configuration manager is operable to initiate identification of the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~ valid for configuration without prompting the user for input prior to the at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~ being determined.

51. (Currently Amended) The apparatus of Claim 48, wherein the configuration manager is operable to identify the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~ valid for configuration without accessing a memory storing the identification of the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~.

52. (Currently Amended) The apparatus of Claim 48, wherein the configuration manager comprises a configurator operable to initiate communication of ~~a probing~~ the probing configuration signal over a virtual channel and toward a destination network element, to receive a response to the configuration signal, and to identify as valid for configuration the at least one of the valid virtual channel and the valid protocol ~~and/or protocol~~ associated with the response.

53. (Original) The apparatus of Claim 52, wherein the probing configuration signal comprises an F5 Operations, Administration, and Maintenance loopback signal.

54. (Original) The apparatus of Claim 52, wherein the probing configuration signal comprises a signal having a self configuring protocol.

55. (Original) The apparatus of Claim 54, wherein the probing configuration signal comprises a Dynamic Host Configuration Protocol request, a Link Control Protocol Configuration Packet, or a Point-to-Point Over Ethernet (PPOE) PADI packet.

56. (Original) The apparatus of Claim 52, wherein the configurator is operable to spawn a plurality of threads, each thread associated with a different virtual channel and operable to determine whether the virtual channel is valid for configuration with the customer premises equipment.

57. (Currently Amended) The apparatus of Claim 52, wherein the configurator is operable to communicate ~~a probing~~ the probing configuration signal toward a destination network element over a first virtual channel and to determine whether the first virtual channel is valid for configuration with the customer premises equipment.

58. (Original) The apparatus of Claim 57, wherein the configurator is further operable to communicate the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channel expires.

59. (Original) The apparatus of Claim 52, wherein the configurator is further operable to, before a time out value associated with the probing configuration signal expires, communicate another probing configuration signal over the same virtual channel.

60. (Original) The apparatus of Claim 52, wherein configurator is operable to communicate over a virtual channel a plurality of probing configuration signals, each signal associated with a different protocol.

61. (Original) The apparatus of Claim 52, wherein the configurator is operable to communicate over a virtual channel a packet comprising a plurality of probing configuration signals, each signal associated with a different protocol.

62. (Original) The apparatus of Claim 52, wherein the configuration manager is further operable to automatically configure the customer premises equipment for operation using a virtual channel carrying the response or a protocol associated with the response.

63. (Original) The apparatus of Claim 48, wherein the configuration manager comprises a configurator operable to:

communicate a diagnostic signal toward a destination network element; and
determine the connectivity of a network layer based on whether a response to the diagnostic signal is received.

64. (Original) The apparatus of Claim 63, wherein the diagnostic signal comprises a Protocol Internet Groper ("PING") signal operable to test an Internet Protocol layer of the network.

65. (Original) The apparatus of Claim 63, wherein the diagnostic signal comprises a domain name server resolution request signal operable to test a Transmission Protocol layer of the network.

66. (Original) The apparatus of Claim 63, wherein the diagnostic signal comprises a Hypertext Transmission Protocol request signal operable to test an Application layer of the network.

67. (Original) The apparatus of Claim 48, wherein the configuration manager resides within a modem at a customer's premises.

68. (Currently Amended) A method of providing automated assistance in configuring customer premises equipment, comprising:

communicating over a virtual channel and toward a destination network element a probing configuration signal, the probing signal operable to identify at least one of a valid virtual channel and a valid protocol without retrieving an identification of the at least one of the valid virtual channel and the valid protocol from a memory storing that information;

receiving over the virtual channel a response to the configuration signal; and

identifying as valid for configuration the at least one of the virtual channel and the valid protocol ~~the virtual channel and/or protocol~~ associated with the response.

69. (Original) The method of Claim 68, wherein the probing configuration signal comprises a signal selected from the group consisting of an F5 Operations, Administration, and Maintenance loopback signal, a Dynamic Host Configuration Protocol request, a Link Control Protocol Configuration Packet, or a Point-to-Point Over Ethernet (PPOE) PADI packet.

70. (Original) The method of Claim 68, wherein communicating the probing configuration signal comprises communicating the probing configuration signal over a plurality of virtual channels approximately simultaneously.

71. (Original) The method of Claim 70, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

 spawning a plurality of threads, each thread operable to process signals associated with at least one virtual channel;

 communicating a probing configuration signal over a plurality of virtual channels; and

 monitoring the probing configuration signal associated with each virtual channel using a separate thread.

72. (Original) The method of Claim 70, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over at least one virtual channel.

73. (Original) The method of Claim 68, wherein communicating the probing configuration signal comprises:

 communicating the signal over a first virtual channel; and

 communicating the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channels expires.

74. (Original) The method of Claim 68, wherein communicating the probing configuration signal comprises:

 communicating a first probing communication signal over a virtual channel; and

 communicating a second probing configuration signal over the same virtual channel before a time out value associated with the first probing configuration signal expires.

75. (Currently Amended) The method of Claim 68, further comprising:

 displaying the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~ to a user;

 receiving the user's selection of the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~; and

 configuring the customer premises equipment for operation using the selected at least one of the valid virtual channel and the valid protocol. ~~selected virtual channel and/or protocol.~~

76. (Currently Amended) The method of Claim 68, further comprising automatically configuring the customer premises equipment for operation using the at least one of the valid virtual channel and the valid protocol ~~the valid virtual channel and/or protocol~~.

77. (Original) The method of Claim 68, further comprising:
communicating a diagnostic signal toward a destination network element; and
determining connectivity of a network layer based on whether a response to the diagnostic signal is received.

78. (Original) The method of Claim 77, wherein the diagnostic signal comprises a signal selected from the group consisting of a Protocol Internet Groper ("PING") signal, a domain name server resolution request signal, and a Hypertext Transmission Protocol request signal.

79. (Original) The method of Claim 77, further comprising reporting on the connectivity of a network layer based on whether a response to the diagnostic signal is received.

80. (New) A method of providing automated assistance in configuring customer premises equipment for communication with another network element, comprising:

automatically identifying at least one of a valid virtual channel and a valid protocol for configuration with the customer premises equipment without retrieving the identification of the at least one of the valid virtual channel and the valid protocol from a memory that stores that information; and

assisting a user in configuring the customer premises equipment for use with the identified virtual channel and/or protocol.

81. (New) A computer readable medium operable to execute the following steps on a processor of a computer:

automatically identifying at least one of a valid virtual channel and a valid protocol for configuration with the customer premises equipment without retrieving the identification of the at least one of the valid virtual channel and the valid protocol from a memory that stores that information; and

assisting a user in configuring the customer premises equipment for use with the identified at least one of the valid virtual channel and the valid protocol.

82. (New) An apparatus operable to provide automated assistance in configuring customer premises equipment, the apparatus comprising:

a configuration manager operable to automatically identify at least one of a valid virtual channel and a valid protocol for configuration with the customer premises equipment without retrieving the identification of the at least one of the valid virtual channel and the valid protocol from a memory that stores that information; and

a memory accessible to the configuration manager and operable to store an identifier of the at least one of the valid virtual channel and the valid protocol based on a response to a probing configuration signal.